IEI Technology Corp.

MODEL:

IDDV-6304140A

140W DC/DC
Smart ATX Converter Module for Vehicle

User Manual

Rev. 1.01 May 2007

RoHS Lead Free

Revision

MODEL	IDDV-6304140A ATX Converter Module	
Revision Number	**Description**	**Date of Issue**
1.03	Added a notice on page 16	June 2007
1.02	- Added two wire cables in the packing list - Modified auto/manual mode information on page 35	June 2007
1.01	Modified some typos	May 2007
1.00	Initial release	May 2007

Copyright

COPYRIGHT NOTICE

The information in this document is subject to change without prior notice in order to improve reliability, design and function and does not represent a commitment on the part of the manufacturer.

In no event will the manufacturer be liable for direct, indirect, special, incidental, or consequential damages arising out of the use or inability to use the product or documentation, even if advised of the possibility of such damages.

This document contains proprietary information protected by copyright. All rights are reserved. No part of this manual may be reproduced by any mechanical, electronic, or other means in any form without prior written permission of the manufacturer.

TRADEMARKS

IBM PC is a registered trademark of International Business Machines Corporation. INTEL is a registered trademark of INTEL Corporation. Other product names mentioned herein are used for identification purposes only and may be trademarks and/or registered trademarks of their respective owners.

Packing List

NOTE:

If any of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the IDDV-6304140A from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

The items listed below should all be included in the IDDV-6304140A package.

- 1 x IDDV-6304140A ATX converter module
- 1 x QIG (Quick Installation Guide)
- 1 x 20-pin ATX to 20-pin ATX/SATA/HDD cable (optional)
- 1 x Wire to battery and ACC on (optional)

Images of the above items are shown in **Chapter 3**.

Table of Contents

1 INTRODUCTION 9

1.1 IDDV-6304140A OVERVIEW 10
1.2 IDDV-6304140A POWER CAPACITY 10
1.3 IDDV-6304140A POWER MODULE FEATURES 11
1.4 IDDV-6304140A DIMENSIONS 12

2 DETAILED SPECIFICATIONS 13

2.1 IDDV-6304140A SYSTEM BLOCK DIAGRAM 14
2.1.1 Functionalities 15
2.2 BATTERY AND IGNITION INPUT 15
2.3 OPERATION MODES 15
2.4 BATTERY STATUS MONITOR 16
2.5 CAR AMPLIFIER 17
2.6 IR MODULE (OPTIONAL) 17

3 UNPACKING 19

3.1 ANTI-STATIC PRECAUTIONS 20
3.2 UNPACKING 20
3.2.1 Unpacking Precautions 20
3.3 UNPACKING CHECKLIST 21
3.3.1 Package Contents 21

4 CONNECTOR PINOUTS 23

4.1 PERIPHERAL INTERFACE CONNECTORS 24
4.1.1 IDDV-6304140A Layout 24
4.1.2 Peripheral Interface Connectors 24
4.1.3 Jumpers 25
4.2 INTERNAL PERIPHERAL CONNECTORS 25
4.2.1 ATX Power Connector 25
4.2.2 Battery Low LED Connector 27
4.2.3 Amplifier On Delay Function Connector 27

4.2.4 Burner Program for Microchip Connector *28*
4.2.5 Input Power Connectors *29*
4.2.6 Infrared Interface Connector (Optional) *30*
4.2.7 Power Switch Connector (External) *31*
4.2.8 Power Switch Connector (Motherboard) *32*
4.3 JUMPER SETTINGS 33
4.3.1 Operation Mode Select Jumper *34*

INDEX 37

List of Figures

Figure 1-1: IDDV-6304140A Dimensions (Inches) 12
Figure 2-1: IDDV-6304140A System Block Diagram 14
Figure 4-1: Connector and Jumper Locations 24
Figure 4-2: ATX Power Connector Location 26
Figure 4-3: J1 Connector Cables 26
Figure 4-4: Battery Low LED Connector Location 27
Figure 4-5: Amplifier On Delay Function Connector Location 28
Figure 4-6: Burner Program for Microchip Connector Location 28
Figure 4-7: Input Power Connector Locations 29
Figure 4-8: CN15, CN16, CN17 Connector Cables 30
Figure 4-9: Infrared Interface Location 31
Figure 4-10: Power Switch (External) Connector Location 32
Figure 4-11: Power Switch (Motherboard) Connector Location 32
Figure 4-12: Jumper Locations 33
Figure 4-13: Operation Mode Select Jumper Location 34

List of Tables

Table 1-1: Maximum Power Capacity 10
Table 2-1: Operation Modes 16
Table 3-1: Package List Contents ..... Error! Bookmark not defined.
Table 4-1: Peripheral Interface Connectors 25
Table 4-2: Rear Panel Connectors 25
Table 4-3: ATX Power Connector Pinouts 26
Table 4-4: Battery Low LED Connector Pinouts (CN19) 27
Table 4-5: Amplifier On Delay Function Connector Pinouts (CN19) 28
Table 4-6: Burner Program for Microchip Connector Pinouts 29
Table 4-7: Input Power Connector Pinouts 30
Table 4-8: Infrared Interface Connector Pinouts 31
Table 4-9: Power Switch (External) Connector Pinouts 32
Table 4-10: Power Switch (Motherboard) Connector Pinouts 33
Table 4-11: Jumpers 33
Table 4-12: Operation Mode Select Jumper Pinouts 34

Chapter

1

Introduction

1.1 IDDV-6304140A Overview

The highly efficient, high-performance 140-watt IDDV-6304140A DC-to-DC vehicle ATX converter module provides 5V, 3.3V, 12V, -12V and 5VSB outputs. The IDDV-6304140A is designed for vehicle PC and receives a wide range of inputs between 6 and 30 VDC. The IDDV-6304140A is built on an intelligent design and provides outstanding line and load regulations. The IDDV-6304140A is capable of sustaining 90% power efficiency.

The power module also has the ability to cut off the 5VSB rail after an amount of time (defined by jumper settings) to prevent the battery from draining. When the battery voltage is below 10.7V for more than thirty seconds, the IDDV-6304140A shuts down. The IDDV-6304140A reactivates again only when the input voltage is higher than 10.7V.

1.2 IDDV-6304140A Power Capacity

The IDDV-6304140A has separated circuitries that enable simultaneous output lines. The maximum power capacity is listed below:

Voltage	Current (Max.)	Ripple (Vp-p)	Line Regulation
5V output	10A	50mV	1.5%
3.3V output	10A	50mV	1.5%
12V output	4A	50mV	1.5%
-12V output	0.15A	150mV	1.5%
5VSB output	1.5A	150mV	1.5%

Table 1-1: Maximum Power Capacity

1.3 IDDV-6304140A Power Module Features

- Highly compact design
- Smart system on/off control
- High efficiency up to 90%
- Load down protection
- Over voltage protection
- Over current protection
- Short circuit protection
- Battery voltage monitor
- Amplifier on-delay control
- RoHS compliant
- IrDA remote control Off (optional)
- Electrical Specifications:
  - Total output capacity: 140W
    - 5V@10A Max.
    - 3.3V@10A Max.
    - 12V@4A Max.
    - -12V@0.15A Max.
    - 5VSB@1.5A Max.
  - Input Voltage: 6VDC to 30VDC
    - Min. input operating voltage: 5.7V
    - Max. input operating voltage: 30V
  - Min. Power Up Voltage: 8V
  - Deep discharged shut down voltage: 10.6V
- Dimensions: 45mm x 160mm
- Environment:
  - Operating temperature: -20°C ~ +85°C
  - Storage temperature: -40°C ~ +125°C
- Weight: NW: 118g

1.4 IDDV-6304140A Dimensions

Figure 1-1 shows the IDDV-6304140A dimensions. The dimensions are given in inches.

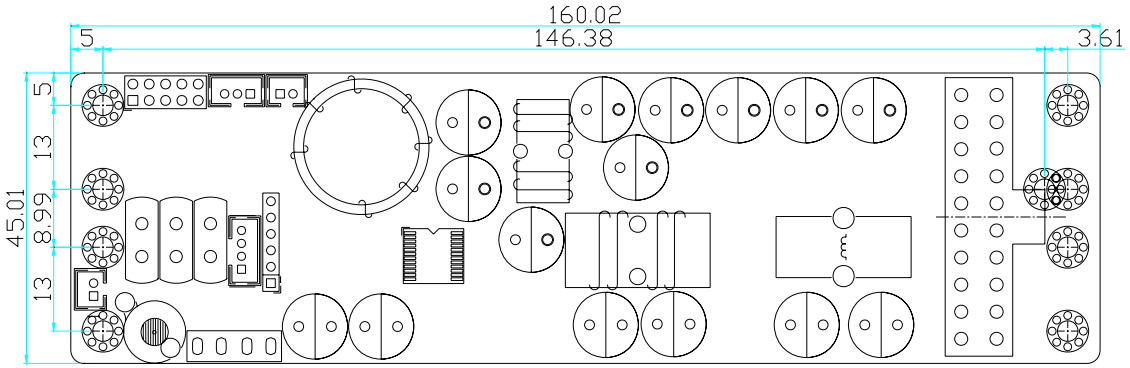


Figure 1-1: IDDV-6304140A Dimensions (mm)

Chapter

2

Detailed Specifications

2.1 IDDV-6304140A System Block Diagram

Figure 2-1 shows the system block diagram of the IDDV-6304140A. The detailed descriptions of the system operation are described in the following sections.

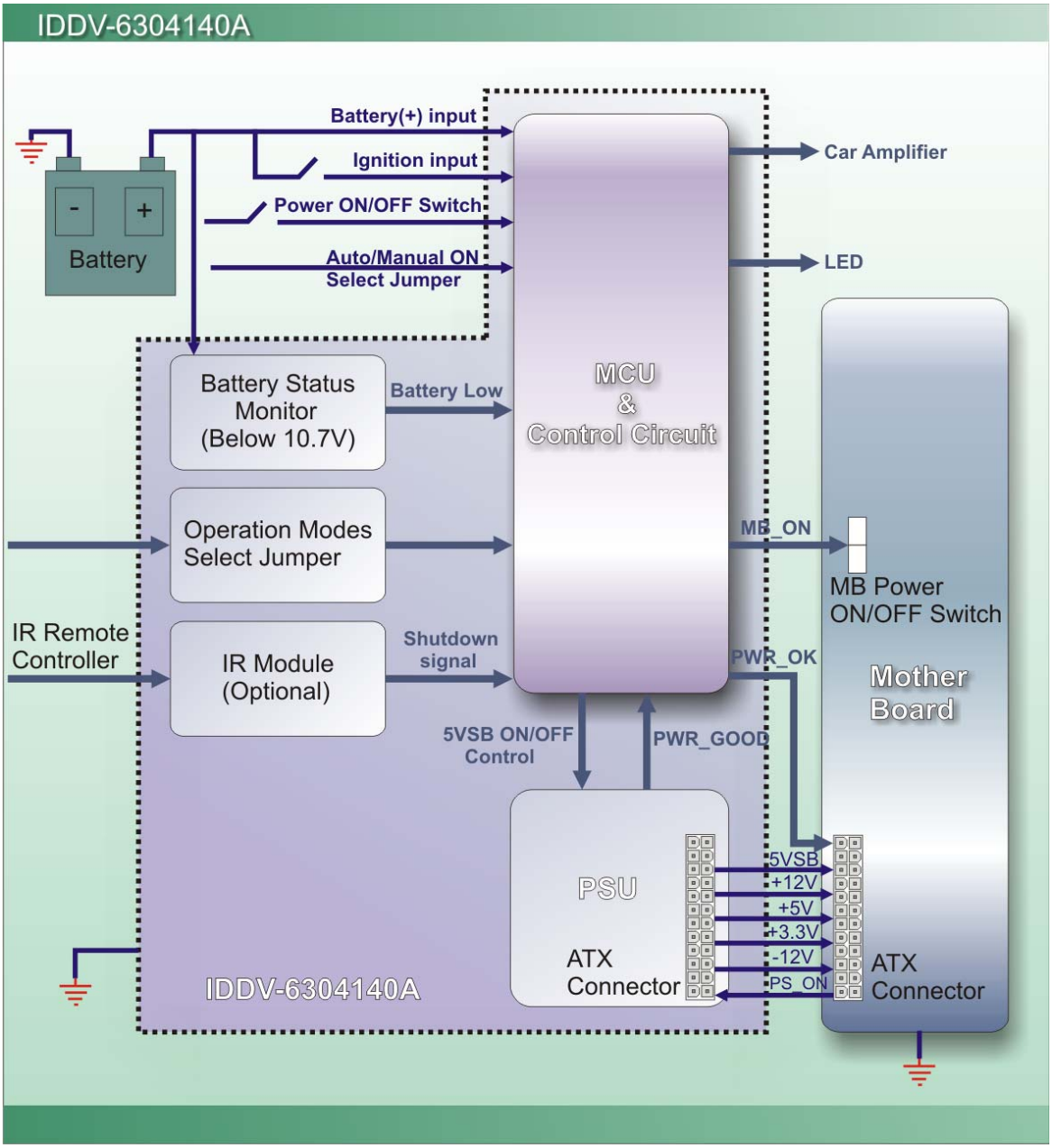


Figure 2-1: IDDV-6304140A System Block Diagram

2.1.1 Functionalities

The IDDV-6304140A has following functionalities:

- Provides power to PSU, MCU and other circuit
- Power on/off controlled by ignition
- Selectable auto/manual mode
- Battery status monitor
- IR module supported (optional)
- Six different operation modes to select soft off and hard off delay time
- Avoids the loud pop when engine starts
- Supports power LED and 20-pin ATX power connector

2.2 Battery and Ignition Input

The car battery connects to the IDDV-6304140A to provide power to PSU, MCU and other circuit board. The power on/off is controlled by the vehicle ignition. When the engine is started, the IDDV-6304140A is on automatically or can be turned on; when the engine is turned off, the device is off.

Use the auto/manual on select jumper to control the auto/manual mode when engine is started. If the auto mode is selected, the motherboard starts automatically when the engine is started. If the manual mode is selected, the user needs to push the on/off button connected to the motherboard to turn on the device after starting the engine. Refer to **Section 4.3.1** for the jumper settings.

2.3 Operation Modes

The user can use the jumpers to set the soft-off/hard-off delay time of the IDDV-6304140A when the car is off. The following table lists the six conditions (depending on the jumper settings) when turning off the vehicle engine.

	Jumper	Soft Off Delay	Hard Off Delay
Case 1		After **10 seconds**, shut down motherboard.	After **10 seconds**, shut down motherboard and cut off 5VSB rail.
Case 2		After **15 seconds**, shut down motherboard.	After **45 seconds**, cut off 5VSB rail.
Case 3		After **15 seconds**, shut down motherboard.	After **1 hour**, cut off 5VSB rail.
Case 4		After **15 seconds**, shut down motherboard.	**Never** deactivate 5VSB. (Still monitor batter status)
Case 5		After **40 seconds**, shut down motherboard.	After **1 hour**, cut off 5VSB rail.
Case 6		After **30 minutes**, shut down motherboard.	**Never** deactivate 5VSB. (Still monitor batter status)

Table 2-1: Operation Modes

NOTE:

If the motherboard fails to perform normal shutdown, IDDV-6304140A waits 1 more minute to turn off the motherboard by force.

2.4 Battery Status Monitor

The IDDV-6304140A continues to monitor the battery voltage when 5VSB is always active (Hard Off Delay = Never). When the battery voltage is below 10.7V for more than 30 seconds, the IDDV-6304140A shuts down. The IDDV-6304140A reactivates again only when the input voltage is higher than 10.7V.

2.5 Car Amplifier

There is a loud pops when the PC starts if the PC is connected to the car amplifier. The IDDV-6304140A can keep the amplifier off while the PC starts. To enable this feature, connect the amplifier on delay function connector to the car stereo amplifier (refer to **Section 4.2.3**).

2.6 IR Module (Optional)

The user can shut down the device by the IR remote controller.

THIS PAGE IS INTENTIONALLY LEFT BLANK

Chapter

3

Unpacking

3.1 Anti-static Precautions

WARNING:

Failure to take ESD precautions during the installation of the IDDV-6304140A may result in permanent damage to the IDDV-6304140A and severe injury to the user.

Electrostatic discharge (ESD) can cause serious damage to electronic components, including the IDDV-6304140A. Dry climates are especially susceptible to ESD. It is therefore critical that whenever the IDDV-6304140A, or any other electrical component is handled, the following anti-static precautions are strictly adhered to.

- ***Wear an anti-static wristband***: Wearing a simple anti-static wristband can help to prevent ESD from damaging the board.
- ***Self-grounding***: Before handling the board touch any grounded conducting material. During the time the board is handled, frequently touch any conducting materials that are connected to the ground.
- ***Use an anti-static pad***: When configuring the IDDV-6304140A, place it on an antic-static pad. This reduces the possibility of ESD damaging the IDDV-6304140A.
- ***Only handle the edges of the PCB***: When handling the PCB, hold the PCB by the edges.

3.2 Unpacking

3.2.1 Unpacking Precautions

When the IDDV-6304140A is unpacked, please do the following:

- Follow the anti-static precautions outlined in **Section 3.1**.
- Make sure the packing box is facing upwards so the IDDV-6304140A does not fall out of the box.
- Make sure all the components shown in **Section 3.3** are present.

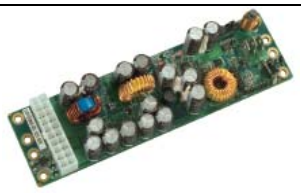
3.3 Unpacking Checklist

NOTE:

If some of the components listed in the checklist below are missing, please do not proceed with the installation. Contact the IEI reseller or vendor you purchased the IDDV-6304140A from or contact an IEI sales representative directly. To contact an IEI sales representative, please send an email to sales@iei.com.tw.

3.3.1 Package Contents

The IDDV-6304140A is shipped with the following components:

Quantity	Item	Image
1	IDDV-6304140A ATX converter module	
1	Wire cable for power switch or motherboard switch (**P/N**: 32100-153400-RS)	
1	Wire cable for LED/amplifier (**P/N**: 32100-153500-RS)	
1	QIG (Quick Installation Guide)	

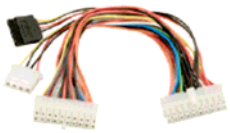
Optional		
1	20-pin ATX to 20-pin ATX/SATA/HDD cable (**P/N**: CB-ATX20PIO-RS)	
1	Wire to battery and ACC on (**P/N**: CB-BATACC-RS)	

Table 3-1: Package List Contents

Chapter

4

Connector Pinouts

4.1 Peripheral Interface Connectors

Section 4.1.2 shows peripheral interface connector locations. **Section 4.1.2** lists all the peripheral interface connectors seen in **Section 4.1.2**.

4.1.1 IDDV-6304140A Layout

Figure 4-1 shows the on-board peripheral connectors, rear panel peripheral connectors and on-board jumpers.

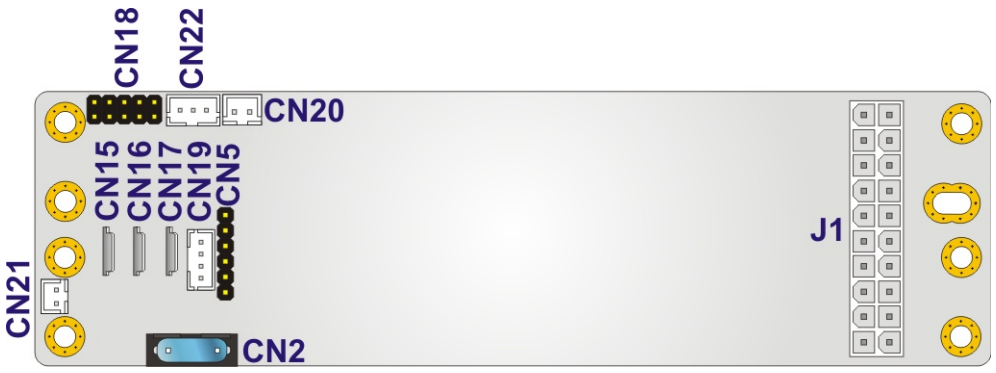


Figure 4-1: Connector and Jumper Locations

4.1.2 Peripheral Interface Connectors

Table 4-1 shows a list of the peripheral interface connectors on the IDDV-6304140A. Detailed descriptions of these connectors can be found below.

Connector	Type	Label
Amplifier on delay function connector	4-pin wafer connector	CN19 (pin 3, pin 4)
ATX power connector	20-pin connector	J1
Battery low LED connector	4-pin wafer connector	CN19 (pin 1, pin 2)
Burner program for microchip connector	6-pin header	CN5
Fuse connector	Mini blade fuses	CN2
Input power connector	Blade connector	CN15, CN16, CN17

IR connector	3-pin wafer connector	CN22
Power switch connector (external)	2-pin wafer connector	CN20
Power switch connector (motherboard)	2-pin wafer connector	CN21

Table 4-1: Peripheral Interface Connectors

4.1.3 Jumpers

Table 4-2 lists the jumpers on the IDDV-6304140A. Detailed descriptions of these jumpers can be found in **Section 4.3**.

Connector	Type	Label
Testing jumper	2-pin header	JP1
Operation mode select jumper	10-pin header	CN18

Table 4-2: Rear Panel Connectors

4.2 Internal Peripheral Connectors

Internal peripheral connectors are found on the motherboard and are only accessible when the motherboard is outside of the chassis. This section has complete descriptions of all the internal, peripheral connectors on the IDDV-6304140A.

4.2.1 ATX Power Connector

CN Label: **J1**

CN Type: 20-pin connector (2x10)

CN Location: See **Figure 4-2**

CN Pinouts: See **Table 4-3**

The 20-pin ATX power connector is connected to an ATX power connector on the motherboard to provide output power.

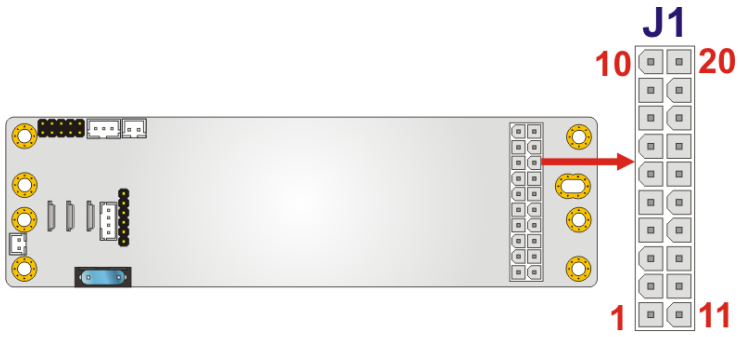


Figure 4-2: ATX Power Connector Location

PIN NO.	DESCRIPTION	PIN NO.	DESCRIPTION
1	3.3V	11	3.3V
2	3.3V	12	-12V
3	GND	13	GND
4	+5V	14	PS_ON
5	GND	15	GND
6	+5V	16	GND
7	GND	17	GND
8	Power good	18	-5V
9	5VSB	19	+5V
10	+12V	20	+5V

Table 4-3: ATX Power Connector Pinouts

Use the following cable to connect J1 with 20-pin ATX connector on the motherboard and SATA/HDD power connector:

	20-pin ATX to 20-pin ATX/SATA/HDD cable (**P/N**: CB-ATX20PIO-RS)

Figure 4-3: J1 Connector Cables

4.2.2 Battery Low LED Connector

CN Label: **CN19** (pin 1, pin 2)

CN Type: 4-pin wafer connector (1x4)

CN Location: See **Figure 4-4**

CN Pinouts: See **Table 4-4**

This connector is connected to a power LED indicator that blinks when the battery is low.

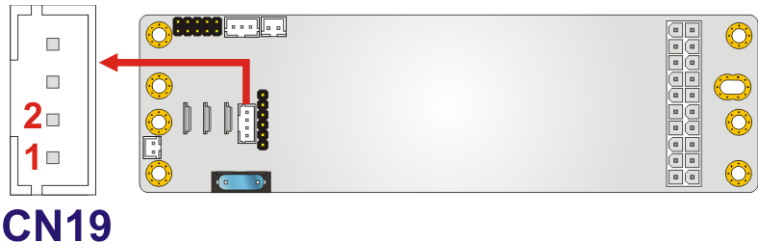


Figure 4-4: Battery Low LED Connector Location

PIN NO.	DESCRIPTION
1	LEDA
2	LEDB

Table 4-4: Battery Low LED Connector Pinouts (CN19)

4.2.3 Amplifier On Delay Function Connector

CN Label: **CN19** (pin 3, pin 4)

CN Type: 4-pin wafer connector (1x4)

CN Location: See **Figure 4-5**

CN Pinouts: See **Table 4-5**

This connector is connected to the car stereo amplifier to avoid the loud pop when the engine starts.

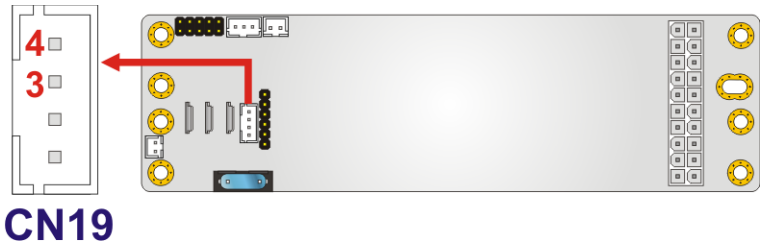


Figure 4-5: Amplifier On Delay Function Connector Location

PIN NO.	DESCRIPTION
3	AMP
4	GROUND

Table 4-5: Amplifier On Delay Function Connector Pinouts (CN19)

4.2.4 Burner Program for Microchip Connector

CN Label: **CN5**

CN Type: 6-pin header (1x6)

CN Location: See **Figure 4-6**

CN Pinouts: See **Table 4-6**

This connector is for burner program of microchip.

Figure 4-6: Burner Program for Microchip Connector Location

PIN NO.	DESCRIPTION
1	MODE D / MCLR
2	Vcc
3	GROUND
4	LED / RB7
5	AMPLIFTER / RB6
6	NC

Table 4-6: Burner Program for Microchip Connector Pinouts

4.2.5 Input Power Connectors

CN Label: **CN15, CN16, CN17**

CN Type: Blade connector

CN Location: See **Figure 4-7**

CN Pinouts: See **Table 4-7**

The input power connectors are connected to the car battery and the car ignition switch.

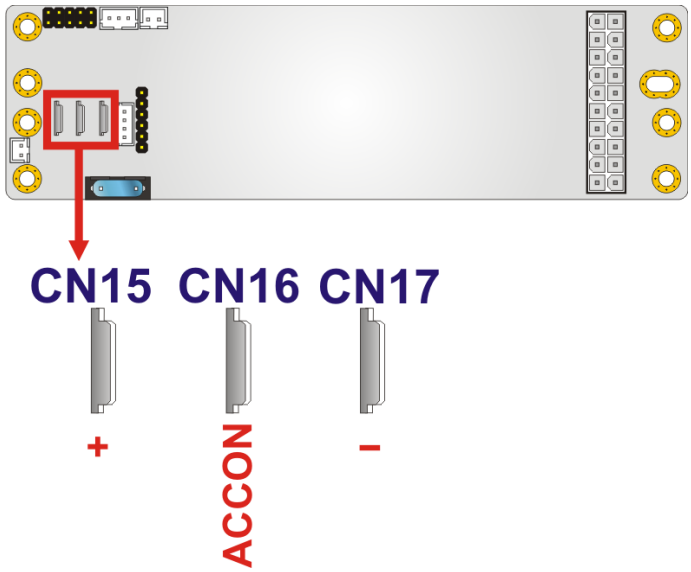


Figure 4-7: Input Power Connector Locations

Connector	DESCRIPTION
CN15	Battery(+)
CN16	ACC On (signal) (Ignition)
CN17	Battery(-) (GND)

Table 4-7: Input Power Connector Pinouts

Use the following cable to connect CN15, CN16 and CN17 with car battery and car ignition switch:

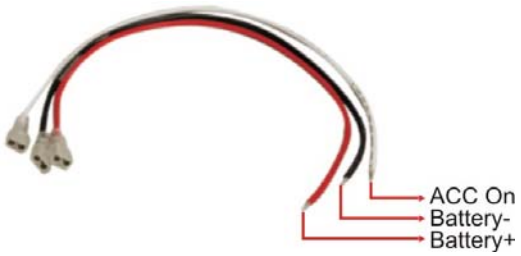
	Wire to battery and ACC on (**P/N**: CB-BATACC-RS)

Figure 4-8: CN15, CN16, CN17 Connector Cables

4.2.6 Infrared Interface Connector (Optional)

CN Label: **CN22**

CN Type: 3-pin wafer connector (1x3)

CN Location: See **Figure 4-9**

CN Pinouts: See **Table 4-8**

The Infrared interface connector is connected to an IR module to enable IR remote control function.

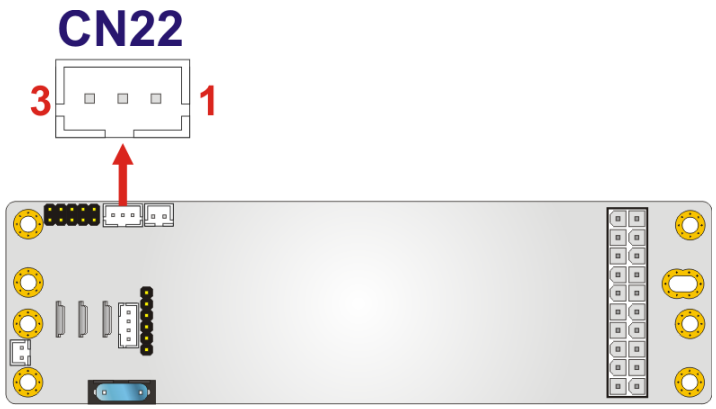


Figure 4-9: Infrared Interface Location

PIN NO.	DESCRIPTION
1	GROUND
2	Vcc (P5V)
3	IRRX

Table 4-8: Infrared Interface Connector Pinouts

4.2.7 Power Switch Connector (External)

CN Label: **CN20**

CN Type: 2-pin wafer connector (1x2)

CN Location: See **Figure 4-10**

CN Pinouts: See **Table 4-9**

This connector is connected to an external power switch on the system to enable users to turn the system on and off.

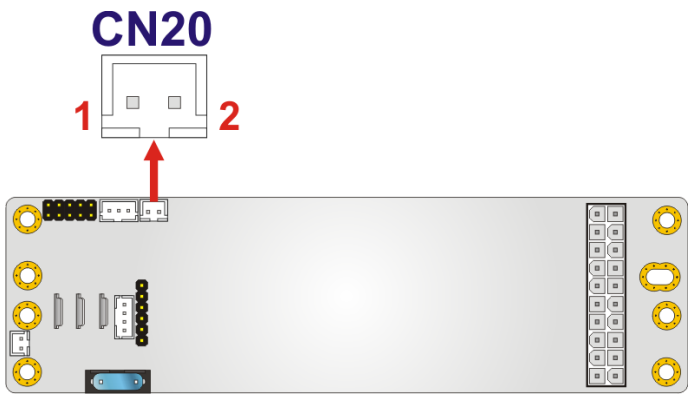


Figure 4-10: Power Switch (External) Connector Location

PIN NO.	DESCRIPTION
1	PWRSW
2	GROUND

Table 4-9: Power Switch (External) Connector Pinouts

4.2.8 Power Switch Connector (Motherboard)

CN Label: **CN21**

CN Type: 2-pin wafer connector (1x2)

CN Location: See **Figure 4-11**

CN Pinouts: See **Table 4-10**

This connector is connected to a power switch connector on the motherboard to turn the motherboard on and off.

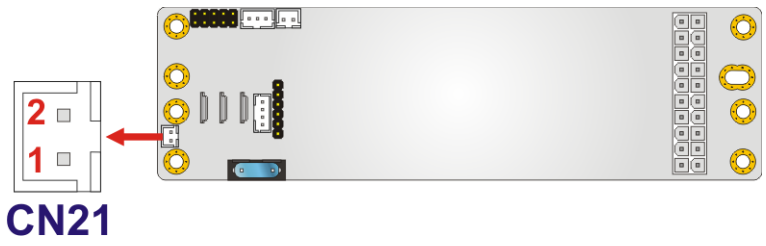


Figure 4-11: Power Switch (Motherboard) Connector Location

PIN NO.	DESCRIPTION
1	MB_SW
2	MB_SW1

Table 4-10: Power Switch (Motherboard) Connector Pinouts

4.3 Jumper Settings

NOTE:

A jumper is a metal bridge used to close an electrical circuit. It consists of two or three metal pins and a small metal clip (often protected by a plastic cover) that slides over the pins to connect them. To CLOSE/SHORT a jumper means connecting the pins of the jumper with the plastic clip and to OPEN a jumper means removing the plastic clip from a jumper.

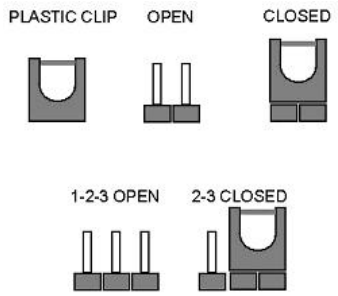


Figure 4-12: Jumper Locations

Before the IDDV-6304140A is installed in the system, the jumpers must be set in accordance with the desired configuration. The jumpers on the IDDV-6304140A are listed in **Table 4-11**.

Description	Label	Type
Testing jumper	2-pin header	JP1
Operation mode select jumper	10-pin header	CN18

Table 4-11: Jumpers

4.3.1 Operation Mode Select Jumper

CN Label: **CN18**

CN Type: 10-pin connector (2x5)

CN Location: See **Figure 4-13**

CN Pinouts: See **Table 4-12**

The operation mode select jumper allows the user to select the soft-off/hard-off delay time (refer to **Section 2.3**) of the IDDV-6304140A when the car is off. This jumper is also used for selecting auto mode or manual mode to start the motherboard.

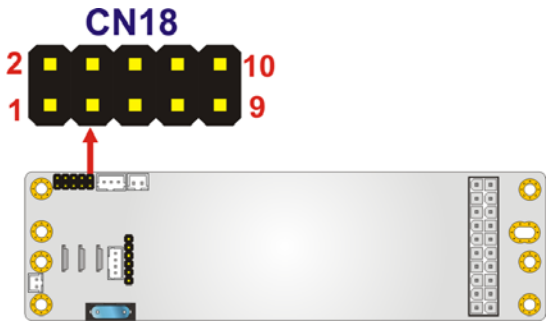


Figure 4-13: Operation Mode Select Jumper Location

FUNCTION	Pin 1-2	Pin 3-4	Pin 5-6	Pin 7-8	Pin 9-10
Case 1	short	open	open	open	
Case 2	open	short	open	open	
Case 3	short	short	open	open	
Case 4	open	open	short	open	
Case 5	short	open	short	open	
Case 6	open	short	short	open	
Auto_On					short
Manual_On					open

Table 4-12: Operation Mode Select Jumper Pinouts

The following section describes how the auto mode/manual mode works in the system:

Auto Mode

Step 1: Activate ignition signal to uP.

Step 2: After 10 seconds, activate 5VSB control signal (turn on 5VSB for motherboard).

Step 3: After another 1 Second, activate “MB_ON/OFF” control signal (turn on motherboard).

Step 4: After 1 more second, activate car amplifier.

Manual Mode

Step 1: Activate ignition signal to uP.

Step 2: After 10 seconds, activate 5VSB control signal (turn on 5VSB for motherboard).

Step 3: After 1 more second, activate car amplifier.

Step 4: Push power button to activate “MB_ON/OFF” control signal (turn on motherboard).

THIS PAGE IS INTENTIONALLY LEFT BLANK

Index

5VSB, 10, 11, 16, 24, 33
anti-static precautions, 19
    anti-static pad, 19
    anti-static wristband, 19
    handling, 19
    self-grounding, 19
ATX power connector, 24
    location and pinouts, 24
auto mode, 15, 32, 33
battery voltage, 10, 16
Burner Program for Microchip, 26
car amplifier, 16, 33
car battery, 15, 27, 28
connectors, pinouts and location
    Amplifier On Delay Function, 25
    ATX power, 23
    Battery Low LED, 25
    Burner Program for Microchip, 26
    Infrared Interface, 28
    Input Power, 27
    Operation Mode Select, 31
    Power Switch, 29
    Power Switch (Motherboard), 30
Dimensions, 5, 7, 11, 12
electrostatic discharge, 19
hard off, 15
hard-off, 15, 32
ignition, 15, 27, 28, 33
ignition switch, 27
Infrared Interface connector, 28
    location and pinouts, 28
Input Power connector, 27
    location and pinouts, 27
IR module, 15, 28
jumper, 31
    jumper configuration, 31
manual mode, 15, 32, 33
Over current protection, 11
Over voltage protection, 11
peripheral connectors, 23
RoHS, 11
Short circuit protection, 11
soft off, 15
soft-off, 15, 32
unpacking, 19
    unpacking checklist, 20
    unpacking precautions, 19